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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,679	06/06/2006	Klaus Hahn	12810-00267-US1	7403
23416	7590	10/13/2010	EXAMINER	
CONNOLLY BOVE LODGE & HUTZ, LLP			NEGRELLI, KARA B	
P O BOX 2207				
WILMINGTON, DE 19899			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,679	HAHN ET AL.	
	Examiner	Art Unit	
	KARA NEGRELLI	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 13 August 2010.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-26 is/are pending in the application.
 4a) Of the above claim(s) 1-6, 10-17, 19 and 21 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 7-9, 18, 20 and 22-26 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ . |

**MOLDABLE FOAM MOLDINGS COMPOSED OF EXPANDABLE PELLETIZED
FILLED POLYMER MATERIALS**

DETAILED ACTION

Response to Amendment

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Any rejections stated in the previous Office Action and not repeated below are withdrawn.
3. Claim 7 has been amended to incorporate the limitations from previously presented claims 19 and 21 (claims renumbered as 19 and 21), specifically to recite, "wherein the polymer materials comprise a styrene polymer and wherein the filler has a particle diameter of from 1 to 50 μm ." Claims 19 and 21 have been cancelled. New claims 24-26 have been added.
4. It is noted that the newly introduced limitations were not present (claims 24-26) at the time of the preceding action. For this reason it is proper to make the present action FINAL.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 7, 9, and 18, 20, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 4,098,941).

7. Johnson teaches molten polystyrene polymer products which are produced by incorporating a foaming agent into a pelletized solid thermoplastic material (pelletized polystyrene, column 5, lines 29-30) (rendering the material expandable) (column 5, lines 20-22). The polymer further comprises an absorbent such as alumina, clay, silica, or activated carbon (graphite) (column 5, lines 20-23 and 38-42) in an amount of 0.1 to 15%, preferably 0.5 to 10%, and up to 30% by weight of the polymer (column 5, lines 42-45). The foaming agent is present in an amount of 0.1 to 15% by weight based on the polystyrene to be expanded (column 5, line 68 to column 6, line 2). The absorbent may have a particle size of 200 mesh or below (74 microns or below) (column 5, lines 45-47).

8. The amount of absorbent of Johnson overlaps the amount of filler in instant claim 7. The amount of blowing agent of Johnson overlaps the amount of blowing agent of instant claim 9. The particle size of the absorbent overlaps the particle size of the filler of instant claim 21. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a *prima facie* case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919

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F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

9. Johnson does not expressly teach using a combination of the listed absorbents, such as silica or alumina and activated carbon (graphite). However, “it is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art.” *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980).

10. Claims 8 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 4,098,941) and further in view of Glück et al. (US 6,340,713) and Tung et al. (US 6,214,897).

11. Johnson teaches the molten polystyrene polymer products as applied to claim 7, but does not expressly teach that the polymer further comprises from 2 to 40% by weight of expandable graphite with an average particle size from 10 to 1000 µm.

12. However, Glück et al. teach expandable styrene polymers comprising graphite particles (column 2, lines 1-6). The styrene polymers may comprise expandable particles (column 4, lines 3-5). The graphite used has a mean particles size of from 1 to 50 µm (column 2, line 36-37). The graphite particles are preferably present in the styrene polymer in amounts of from 0.05% to 25% by weight (column 2, lines 40-42).

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The expandable styrene polymers further comprise from 3 to 10% by weight, based on the weight of the polymer, of a blowing agent (column 3, lines 61-62).

13. It would have been obvious for one of ordinary skill in the art at the time the invention was made to use graphite particles, as taught by Glück et al., in the pelletized thermoplastic polymer (styrene) of Johnson because the expandable products of Glück et al. which contain graphite particles have reduced thermal conductivity (column 4, lines 20-23). Furthermore, when moldings are formed from the expandable styrene polymers of Glück et al., the addition of graphite particles to the polymers leads to a shortening of from 10 to 90% in the cooling time until welded materials can be removed from the mold (column 4, lines 13-16).

14. Glück et al. teach do not expressly teach that the graphite is expandable. However, Tung et al. teach a foamable polymer composition comprising 1 to 10 parts by weight blowing agent (based on 100 parts by weight polymer composition) (column 10, lines 26-30), 0 to 60 parts by weight (based on 100 parts polymer composition) of a filler such as a silicate filler, aluminum oxides, chalk, or clay (column 10, lines 55-65), and a flame retardant such as phosphates, red phosphorous (column 10, lines 42-43), expandable graphite (column 10, line 49), or mixtures thereof (column 10, lines 50-54).

15. It would have been obvious to one of ordinary skill in the art to use expandable graphite and phosphates as taught by Tung et al. for use in the compositions of Glück et al. and Johnson in order to enhance the flame retardant properties of the styrene products (Tung et al., column 10, lines 36-37).

16. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 4,098,941) and further in view of Bieser et al. (US 5,973, 049).

17. Johnson teaches molten polystyrene polymer products which are produced by incorporating a foaming agent into a pelletized solid thermoplastic material (pelletized polystyrene, column 5, lines 29-30) (rendering the material expandable) (column 5, lines 20-22) as applied to claims 7 and 24 above, the rejection of which is incorporated herein. Johnson does not expressly teach that the absorbent such as alumina, clay, silica, or activated carbon (graphite) (column 5, lines 20-23 and 38-42) comprises chalk.

18. However, teaches Bieser et al. teach that silica, alumina, clay, calcium silicate, glass spheres and chalk are used as inorganic fillers for filled polymer compositions (column 7, lines 56-67) such as extruder foams (column 13, lines 43-55). In view of Bieser's recognition that silica (or alumina, clay, calcium silicate, talc, calcium carbonate or glass spheres) and chalk are equivalent and interchangeable, it would have been obvious to one of ordinary skill in the art to substitute silica with chalk and thereby arrive at the present invention. Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See *In re Ruff* 118 USPQ 343 (CCPA 1958).

Response to Arguments

19. Applicant's arguments filed August 13, 2010 have been fully considered but they are not persuasive.

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20. Applicant argues that the Johnson (US 4,098,941) is directed to an intergral polystyrene foam extrudate in tubular form having a density gradient decreasing from the external surfaces inwardly. Applicant asserts that Johnson does not teach expandable pelletized thermoplastic polymer material. Applicant states that this statement is a misinterpretation of the Johnson reference. Applicant argues that "the word 'pelletized' clearly refers to the polymer used as pelletized raw material and not to the expandable polymer that includes blowing agent."

21. Applicant's argument is not persuasive. Column 5, lines 20-27 of Johnson teach explicitly teach an embodiment of the invention which incorporates a foaming agent into a polymer material by premixing the pelletized solid thermoplastic polymer, e.g. a styrene polymer, with a minor amount of absorbent having absorbed thereof a volatile liquid. Before activation of the blowing agent, the premixed, pelletized theromplastic polymer material, e.g. styrene, is an expandable pelletized thermoplastic material. As stated above, the absorbent may comprise alumina, clay, silica, or activated carbon (graphite) (column 5, lines 20-23 and 38-42) in an amount of 0.1 to 15%, preferably 0.5 to 10%, and up to 30% by weight of the polymer (column 5, lines 42-45). The absorbent may have a particle size of 200 mesh or below (74 microns or below) (column 5, lines 45-47). The foaming agent is present in an amount of 0.1 to 15% by weight based on the polystyrene to be expanded (column 5, line 68 to column 6, line 2). The amount of absorbent of Johnson overlaps the amount of filler in instant claim 7. The amount of blowing agent of Johnson overlaps the amount of blowing agent of instant claim 9. The particle size of the absorbent overlaps the particle

size of the filler of instant claim 21. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a *prima facie* case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

22. With regards to the applicants' argument that "the mixing of the premix can only be done with the molten polystyrene," it is first noted that applicant has not provided evidence that this is the ONLY manner in which the invention of Johnson may be prepared. Regardless, the claims are drawn to a composition. Applicant argues that "in the process according to Johnson, the blowing agent-containing polystyrene melt is not cooled and pelletized to expandable polystyrene pellets..." on page 6, last paragraph of the Remarks filed August 13, 2010. However, it is noted that the features upon which applicant relies (i.e., cooling a melt and pelletizing said melt, in addition to "mixing of the premix can only be done with molten polystyrene") are not recited in the rejected claim(s). The claims recite "An expandable pelletized thermoplastic material which comprises from 5 to 50% of one or more fillers selected from talc, chalk, kaolin, aluminum hydroxide, aluminum nitrite, aluminum silicate, calcium carbonate, calcium sulfate, silica, powdered quartz, Aerosil, alumina and glass beads, and wherein the polymer materials comprise a styrene polymer and wherein the filler has an average particle diameter of 1 to 50 μm ." Johson teaches exactly this, as described in the

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rejection above. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Because the expandable, pelletized polystyrene particles of Johnson may comprise the same materials in the same amounts as taught in instant claim 7, the expandable, pelletized particles of Johnson will have the same properties as the instantly claimed particles, including the properties discussed on page 7 of the applicants' Remarks filed August 13, 2010. Regardless of this fact, it is again noted that the features upon which applicant relies (i.e., very little loss of blowing agent during storage even at higher filler contents and a reduction in the content of blowing agent) are not recited in the rejected claim(s).

23. As previously stated, while Johnson does not expressly teach using a combination of the listed absorbents, such as silica or alumina and activated carbon (graphite), "it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980).

24. As to applicants' arguments with regards to Glück and Tung, the discussion above with regards to Johnson is incorporated herein. It is additionally noted that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir.

1986). It is noted that 1) the instant claims do not exclude halogenated compounds (in regards to the third and fourth full paragraphs of page 7 of the applicants' Remarks), 2) regardless of the fact that Glück may teach brominated compounds, Glück (as well as Tung) is used as a teaching reference and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, and in combination with the primary reference, discloses the presently claimed invention. Applicant asserts that "the graphite [of Glück] functions as an infrared absorber to lower thermal conductivity" and "is different from the claimed expandable graphite which is described on page 8, lines 22-25 and which functions as a flame retardant." Applicant has not provided any evidence that the graphite of Glück does not also function as a flame retardant. Applicant has not provided any evidence demonstrating the supposed differences between the graphite of Glück and the instantly claimed graphite.

25. As to applicants' arguments with regards to Tung, it is once again noted that Tung is a teaching reference and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, expandable graphite used in the production of thermoplastic foam materials, and in combination with the primary reference, discloses the presently claimed invention.

26. Applicant further asserts that "Persons skilled in the art have no motivation to combine the teachings of Glück with the teaching of Tung since the polymer compositions as well as the process are totally different. Applicant argues that there is not indication in Glück for a need to enhance flammability, nor any indication in Tung that this could be achieved by selecting expandable graphite.

27. Applicants' argument is not persuasive. Applicants' statement that "There is not even the slightly suggestion of an expandable pelletized polymer" in Tung is erroneous. Column 3, lines 40-46 of Tung explicitly teaches that the foamable (expandable) thermoplastic compositions of the invention (the composition comprises blowing agent) may be pelletized before being used to produce articles. Additionally, both Glück and Tung are from the same field of endeavor: expandable thermoplastic materials comprising blowing agent and graphite additives. Although Glück and/or Tung may uses graphite in a different capacity than applicant, case law holds that it "does not alter the conclusion that its use in a prior art composition would have been *prima facie* obvious from the purpose disclosed in the reference." *In re Linter*, 458 F.2d 1013, 173 USPQ 560 (CCPA 1972). While this motivation may not be the same motivation as in the present invention, it is noted that obviousness under 103 is not negated because the motivation to arrive at the claimed invention as disclosed by the prior art does not agree with applicant's motivation. *In re Dillon*, 16 USPQ2d 1897 (Fed. Cir. 1990), *In re Tomlinson*, 150 USPQ 623 (CCPA 1996).

28. No where in there an indication in either Glück or Tung for a desire to "increase flammability" as stated in the first full paragraph on page 8 of the applicants' arguments

filed August 13, 2010. Furthermore, it would have been obvious to one of ordinary skill in the art to use expandable graphite and phosphates as taught by Tung et al. for use in the compositions of Glück et al. and Johnson in order to enhance the flame retardant properties of the styrene products (Tung et al., column 10, lines 36-37).

29. As to the applicants' argument that "persons skilled in the art would not have predicted a synergistic effect due a combination of filled, such as chalk, with expandable graphite for achieving an inexpensive and halogen-free flame retardancy," first, it is again noted that the features upon which applicant relies (i.e., an inexpensive and halogen-free flame retardancy) are not recited in the rejected claim(s). Additionally, there is no evidence to support the applicants' alleged "unexpected results," i.e. a synergistic effect due to the combination of expandable graphite and chalk. Furthermore, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In addition, the examiner takes official notice that a person skilled in the art would recognize that chalk (as well as alumina, silica, graphite, clay, calcium carbonate, calcium silicate, and glass beads) are inexpensive fillers which are added to foamed polymer compositions and which may further increase or impart flame-retardancy to the materials to which they are added. The use of non-halogenated flame retardants is also well known in the art. See, for example, paragraph [0008], [0013]-[0014], and [0151], of Iwade et al. (US 2005/0260404), which teaches that the combination of red phosphorus or phosphorus

and expanded graphite to a polymer composition is known to impart flame retardant properties. See also paragraphs [0311]-[0312] of Sasagawa et al. (US 2005/0234193) which teach that the synergist effect of inorganic fillers on halogen-free flame retardants is known in the art.

30. As to applicants' argument that "Newly presented claim 24 is patentable for the additional reason that no significant deterioration in mechanical properties, such as flexural strength or compressive strength is observed in the claimed filler amount," first, it is noted that the features upon which applicant relies (i.e., no significant deterioration in flexural strength or compressive strength) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, Johnson teaches an expandable pelletized polystyrene material (for the reasons provided above) which may have a filler such as alumina, silica, activated carbon (graphite) or clay in the amount claimed. Thus, the pelletized polystyrene of Johson would inherently have the flexural strength or compressive strength observed in the claimed filler amount.

Conclusion

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

32. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARA NEGRELLI whose telephone number is (571)270-7338. The examiner can normally be reached on Monday through Friday 9:30 am EST to 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571)272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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